IN THE CLAIMS:

Please amend the claims as follows:

1. - 35. (Cancelled)

Please add the following new claims:

36. (New) A method of monitoring channels of an optical add/drop multiplexer having sequentially arranged first and second drop channels and sequentially arranged first and second add channels, the method comprising:

receiving an input signal at an input of the optical multiplexer;

dropping a first signal from the input signal via the first drop channel;

tapping a portion of the first signal;

determining an optical signal to noise ratio of the first drop channel using the tapped portion of the first signal;

dropping a second signal from the input signal after the first signal has been dropped from the input signal, via the second drop channel;

tapping a portion of the second signal;

determining an optical signal to noise ratio of the second drop channel using the tapped portion of the second signal;

monitoring performance of a third signal that is to be added to the input signal;

adding the third signal to the input signal after the first and second signals have been dropped from the input signal, via the first add channel;

monitoring performance of a fourth signal that is to be added to the input signal; and

adding the fourth signal to the input signal after the third signal has been added to the input signal, via the second add channel.

37. (New) The method of Claim 36, wherein analyzing the portion of the first signal to determine the optical signal to noise ratio comprises:

converting the portion of the first signal to a digital signal;

sampling a plurality of data points in the digital signal continuously at a frequency;

determining an average power of the sampled points;

calculating a noise spectrum density based on the sampled points; and

determining the optical signal to noise ratio from the noise spectrum density and the average power of the sampled points.

38. (New) The method of Claim 37, further comprising computing the average optical power using a pre-saved calibration table.

39. (New) The method of Claim 37, wherein the plurality of data points is approximately 1024 points.

40. (New) The method of Claim 37, wherein the plurality of data points is sampled for a predetermined amount of time.

41. (New) The method of Claim 37, wherein the predetermined amount of time is 10 ms.

42. (New) The method of Claim 36, wherein analyzing the portion of the first signal to determine the optical signal to noise ratio comprises:

selecting a frequency range based on network traffic protocol and transmission rate;

converting the portion of the first signal to a digital signal;

sampling 1024 points in the digital signal continuously at a sampling frequency;

determining an average power of the points;

generating a spectrum in the frequency domain utilizing a Fast Fourier Transform;

generating a noise spectrum density from the spectrum and the frequency range; and

calculating the optical signal to noise ratio from the noise spectrum density and the average sampled points.

43. (New) The method of Claim 36, wherein the optical signal to noise ratio is based on the following equation:

$$OSNR = \frac{P_{sig}}{P_{ase}} \frac{B_o}{R}$$

where the symbol "P_{sig}" denotes a signal power of the sampled points, the symbol "P_{ase}" denotes an Amplified Spontaneous Emission (ASE) power of the sampled points, the symbol "B_o" denotes a filter band width, and the symbol "R" denotes a wavelength resolution.

44. (New) The method of Claim 36, wherein the first drop channel includes a performance monitor cell and a filter.

45. (New) The method of Claim 44, wherein the performance monitor cell includes a coupler which is used in tapping the portion of the first signal.

46. (New) The method of Claim 36, further comprising transmitting an output signal from an output of the optical multiplexer.

47. (New) The method of Claim 36, wherein each add channel includes a variable attenuator, a performance monitor cell and a filter.